
بسم الله الرحمن الرحيم

FAILURE

in Fixed Prosthodontics

Presented by

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A general term used to imply that a part in service ;

- Has become completely inoperable.

OR

- Is still operable but, unable to adequately performing its intended function.

OR

- Has deteriorated seriously, to the point that it has become unreliable or unsafe for continued use.

A failure may result when a fault has occurred . Fault is an incorrect step or process.

- Improper case selection .
- Improper diagnosis and treatment planning .
- Inaccurate clinical procedures .
- Inaccurate laboratory procedures .
- Insufficient post insertion care and maintenance .

Types Of Failure

- Biological failures.
- Mechanical failures.
- Esthetic failures.
- Maintenance failures.

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Biological failures

Caries

- One of the most biologic failures in fixed prosthodontics
- It represent **36%** of frequent causes of failure.
- A study on **77** bridges ;
  - **32%** required removal
  - **10%** were removed because of untreatable caries of abutment

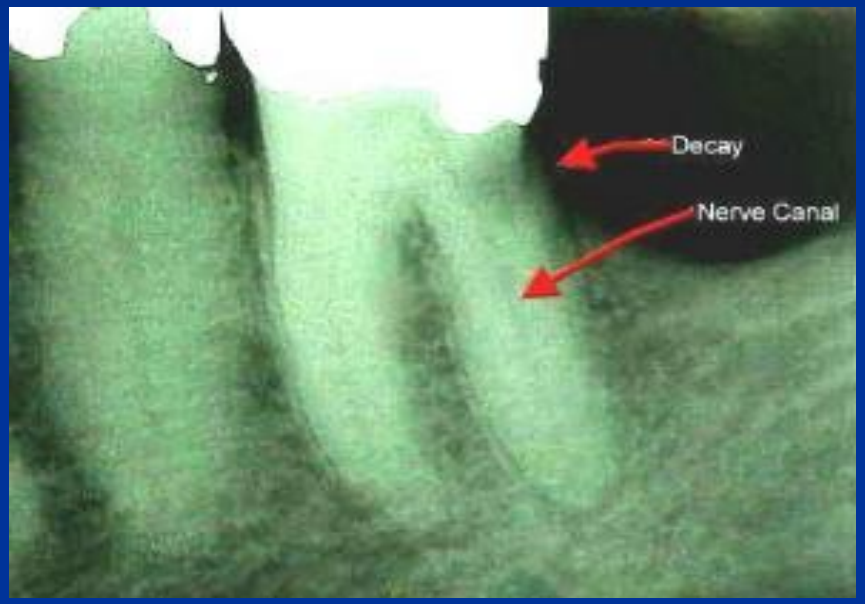
- Another study found that the **incidence of caries** was **not** related to the age of patient but, rather to the time that the bridge had functioned.

The patient complains from:

- **Pain** or sensitivity to cold and sweet
- **Bad** taste and breath.
- **Loose** restoration.
- **Unsatisfied** esthetic.

Root surface caries

- Commonly associated with **gingival recession** and **periodontal pockets** .
- **Reduced** salivary flow .


Decay
Nerve Canal

- A study on **196** cases ;
  - **52%** root caries were found in men .
  - **35%** root caries were found in women .
- There was **no** correlation between the root caries incidence and the number of daily medication taken.

Caries at the margin

- Mainly as the result of inaccurately fit margins;
  - Open.
  - Short.
  - Over extended.

That leads to **dissolution** of luting cement and allow **leakage** of saliva and micro-organisms.

- A **higher caries** incidence was found around crowns with **poor margins** compared to those with **good margins**.

Caries beneath the restoration

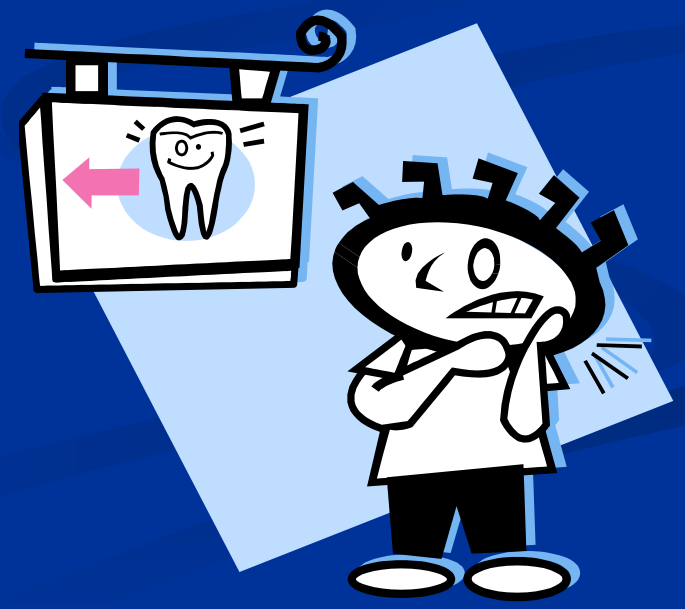
- This can be due to;
  - Incomplete removal of caries .
  - Loose retainer.

- A study studying caries beneath restoration found that ;
  - **0.4%** under single crowns.
  - **18%** under fixed partial denture.
  - **0.8%** under all ceramic crown.
  - **2%** under post and core.

Pulp injury

The patient complains from:

- Intense spontaneous **pain** .
- **Pain** is related to hot ,cold or sweet.
- Increase at night and by lying down position .



Pulp Injury may be due to ;

- **Over heating** and **dehydration** of dentine .
- **Over reduction** .
- **In**adequate **treatment** of **caries** .
- **Minute** unnoticed **pulp exposure** .
- **In**adequate **protection** of the prepared tooth .
- Using of **irritating luting** agent .
- Low grade **pulp infection** activated by traumatic occlusion .

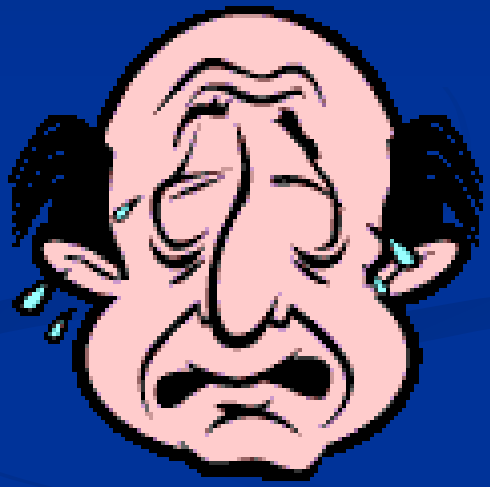
- In a study investigating **causes of pulp necrosis** for a period of **8** years , Found that;
  - **15%** of teeth were used as abutments.
  - **3%** were non-abutment teeth.
- Another study showed that **4%** of vital teeth developed **pulpal necrosis** after placement of **single crowns**.
- In a third study **57%** of all **failed bridges** had **one or both** of their abutments so affected .

- The **survival** probability of the **pulp** in vital teeth restored with **single unit** crown was **higher** than in those teeth serving as an **abutment** of **fixed- fixed** bridge .
  - **84%** single crown.
  - **71%** bridge retainer .
- Greater number of **maxillary anterior teeth** serving as bridge abutments developed **pulpal necrosis** more than any **other tooth type** .

Periodontal breakdown

The patient complains from:

- **Looseness** of teeth and restoration.
- **Bad** taste and breath.
- **Pain**.
- **Movement** of teeth.
- **Bad** esthetic.
- **Redness**, **swelling** and bleeding gingiva.
- Periodontal **pocket** and **abscess**.



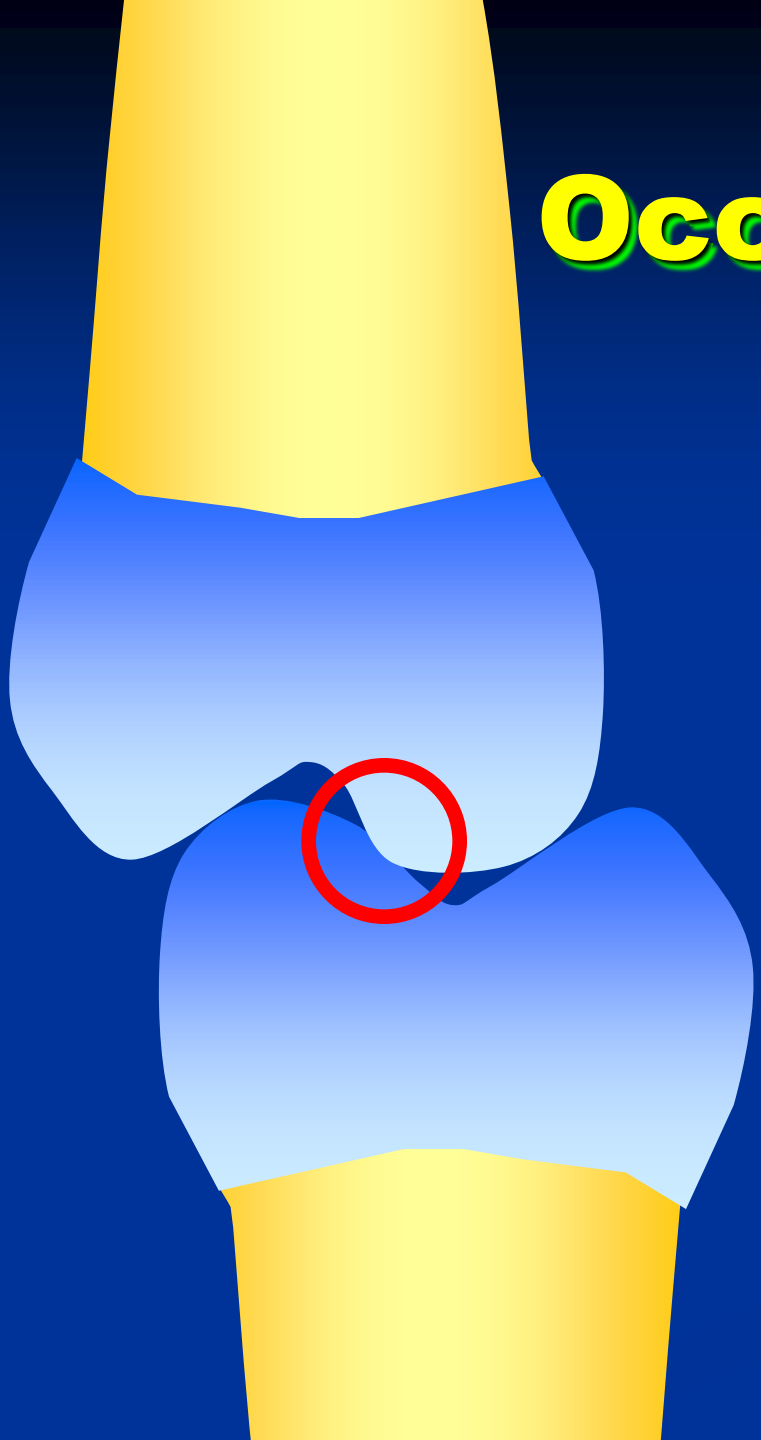
Causes

- Bad **oral hygiene** .
- **Periodontaly** affected abutment .
- Improper **bridge design** .
- Insufficient **reduction** .
- **Subgingival** finish line .
- Trumatic **gingival retraction** .
- Improper **cervical margin** .
- Improper **pontic design** .

- A study reported **only 0.6 %** difference in periodontal complication between the **restored teeth** (single crowns) and **unrestored teeth.** Which increased around **bridge abutment 4 %**.

- **Some studies** have shown a **high incidence** of **periodontal disease** associated with **fixed prostheses** , while **other studies** have shown a **low incidence** of this complication .

Occlusal problems



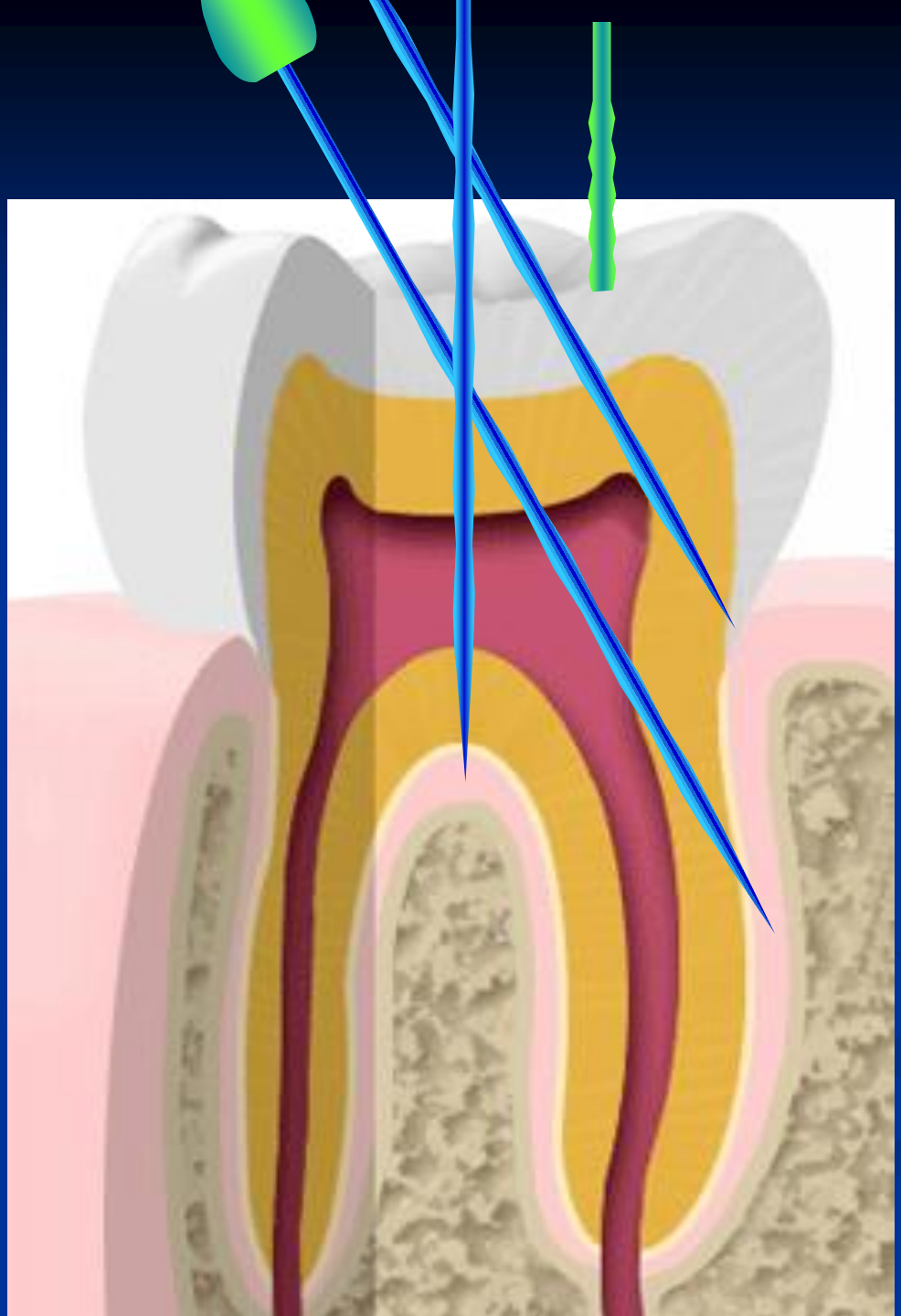
The patient complains from:

- General discomfort with **bite** .
- **Pain** in **muscles** and **T.M.J** .
- **Loose** teeth or bridge .

- **Traumatic occlusion** : an injury to the **periodontal tissue** and **pulp** of a tooth as the result of occlusal forces by an opposing tooth or teeth .
- Premature contact in **centric** or **eccentric** occlusal contact leads to :
  - Excessive tooth mobility.
  - Pulp damage .
  - T.M.J disorder .

Tooth perforation

- Improper located **pinholes** or **pins** .
- Improper **endodontic** treatment .
- Improper **post** preparation .

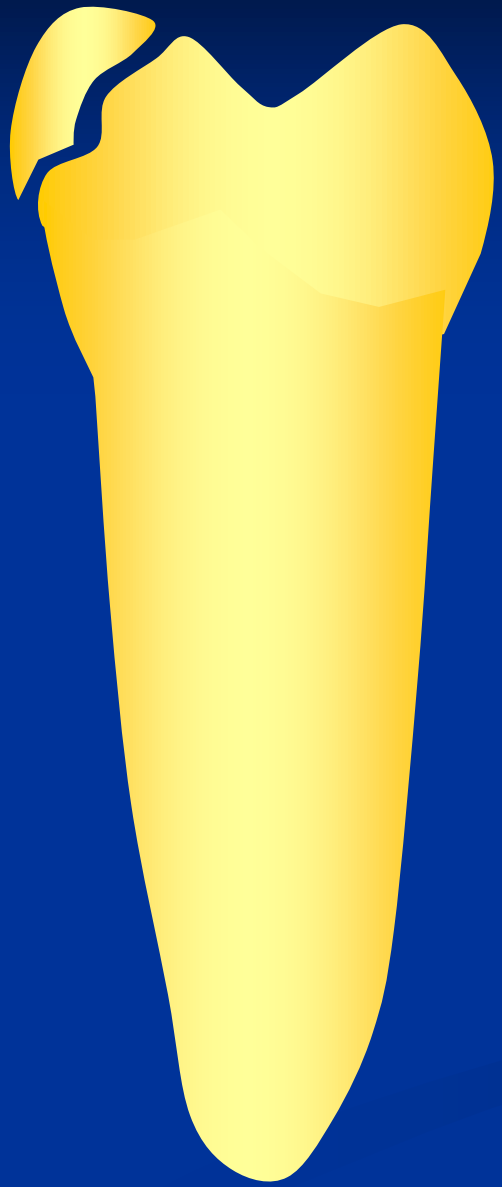


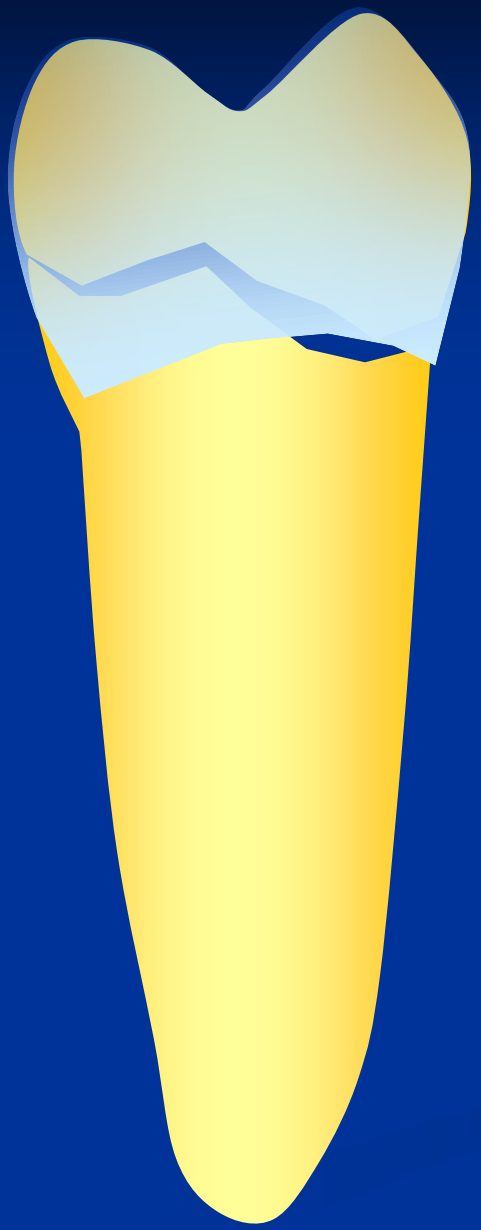
Mineral Trioxide Aggregate (MTA)

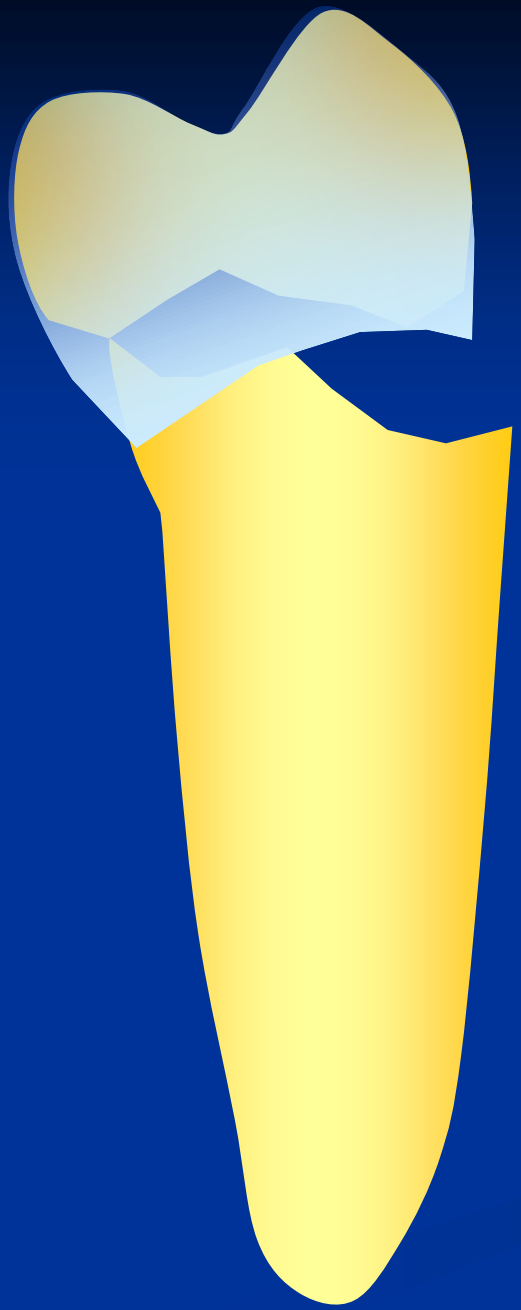
- It is a compound mixture of hydrophilic tricalcium silicate , tricalcium oxide and tricalcium aluminate .
- The material sets in **moist environment** and has low solubility .

Abutment fracture

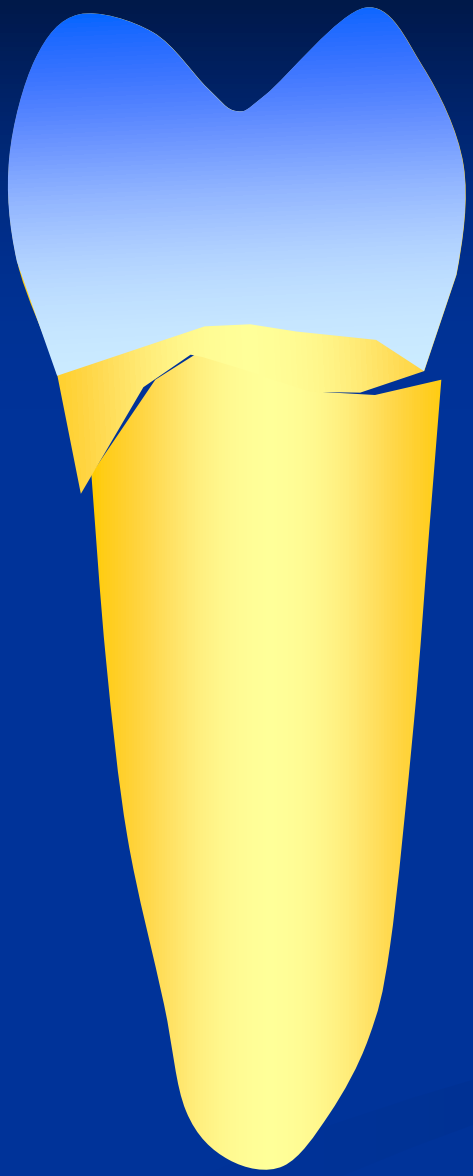
- **Coronal tooth fracture :**
  - **Over** reduction .
  - Recurrent **caries** .
  - Occlusal **trauma** .
  - Excessive trauma during **seating** or **removal** of prosthesis .

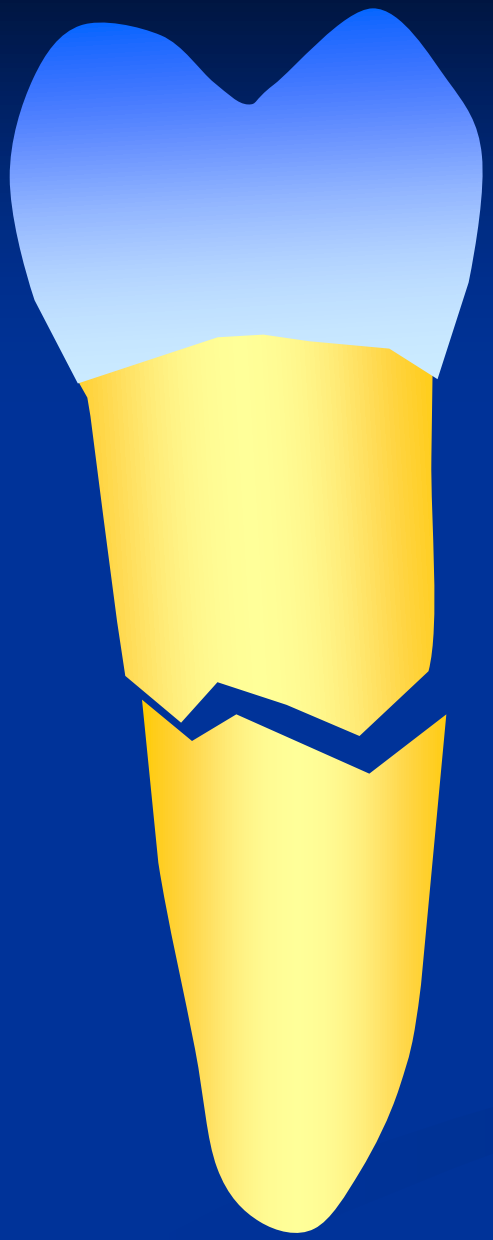


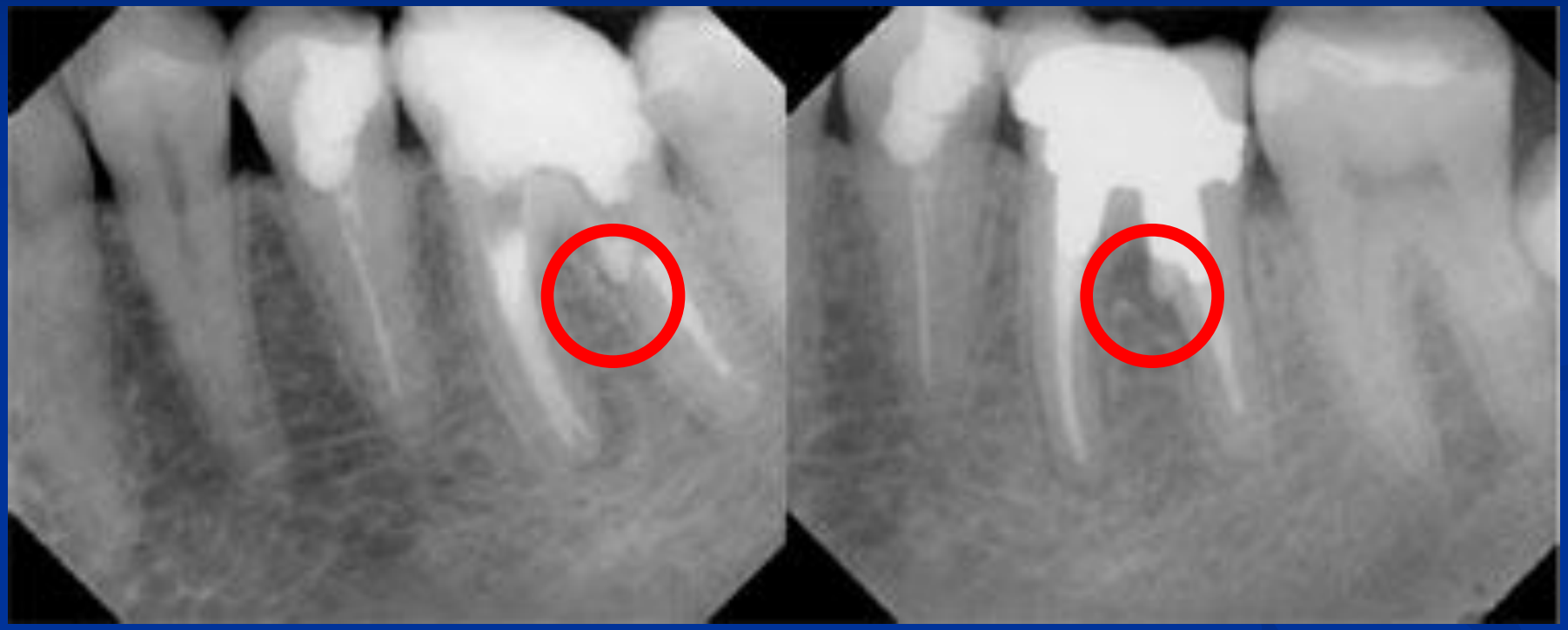




- **Root fracture :**
  - Excessive **widening** of the root canal.
  - **Forceful seating** of the **post** and core.
  - Root **caries** .
  - **Trauma** .







Allergic problems

- Due to biological response of tissue .

Discomfort , pain and sensitivity

- Excessive pressure on the soft tissue.
- Retention of food on the occlusal surface .
- Traumatic occlusion .
- Cervical hyper sensitivity.
- Torque

- Excessive pressure on the soft tissue.

- Retention of food on the occlusal surface .

- Traumatic occlusion .

Due to presence of premature contact.

- Cervical hyper sensitivity

- Torque
  - Improper parallel relationship between axial walls.
  - Absence of temporary protection.
  - Improper assembly during soldering.

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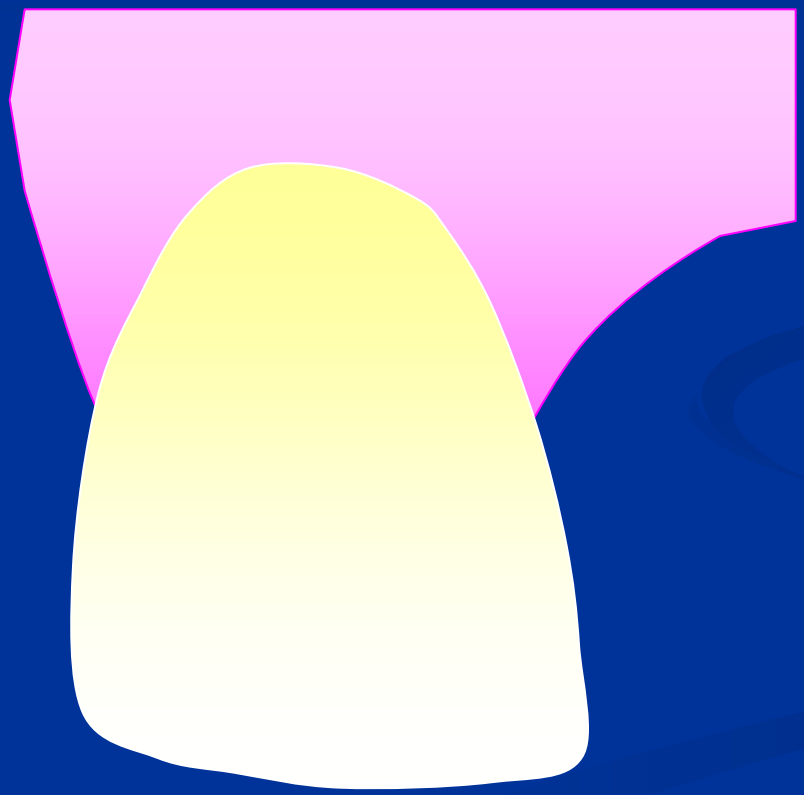
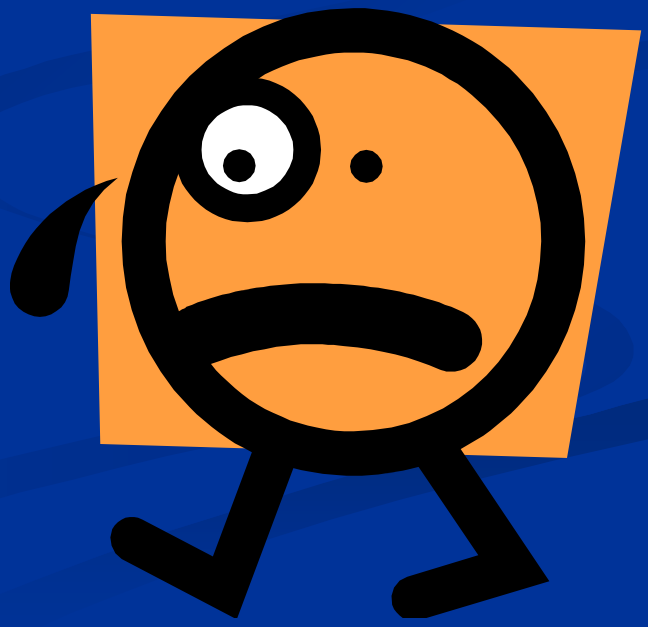
Mechanical failures

Loose retainer

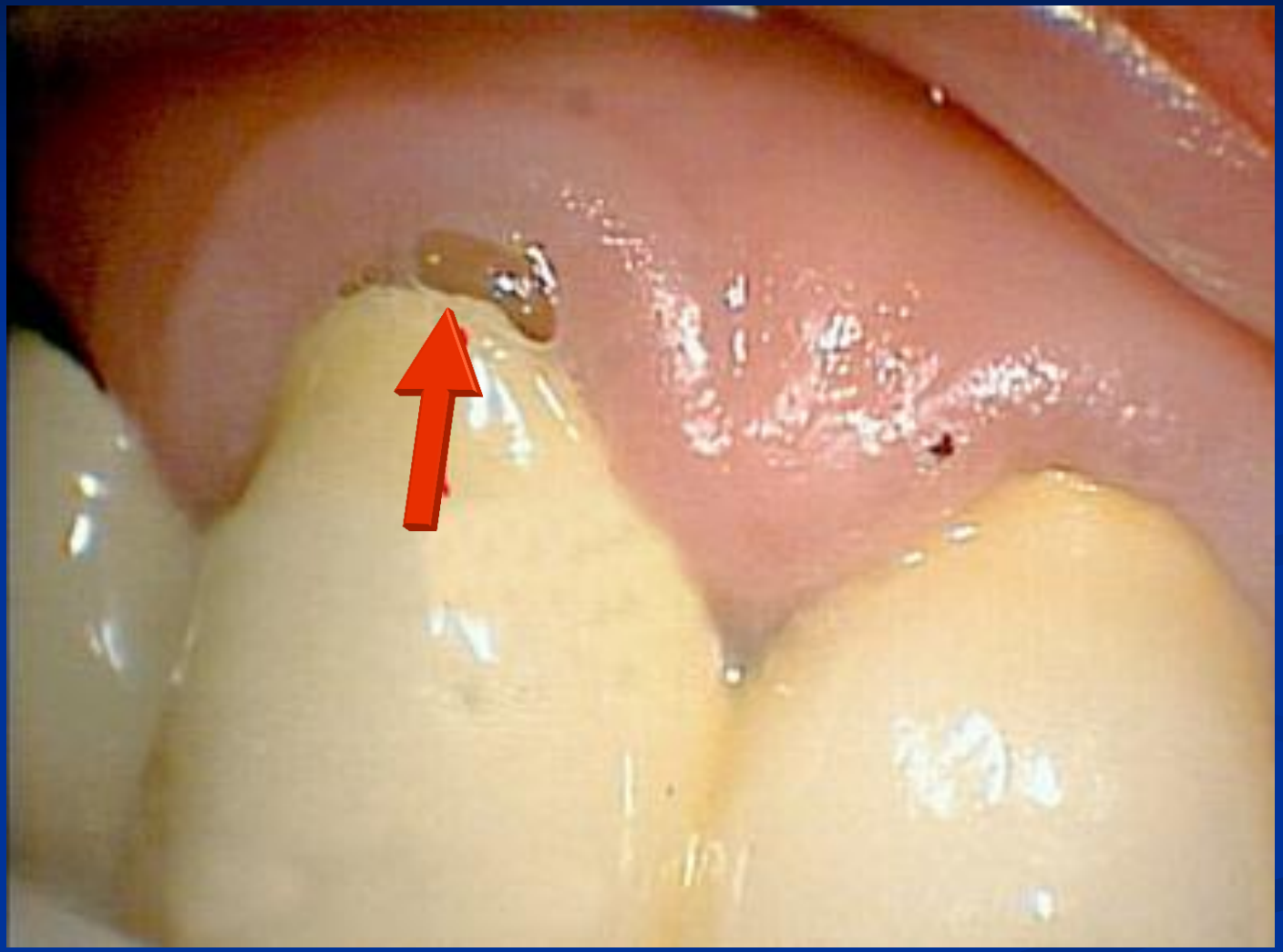


The patient complains from:

- **Bad** taste or smell at the site of prosthesis .
- **Sensitivity** to temperature or sweet.



How to detect looseness ?



Causes of looseness

Improper case selection

- Mobility of abutment .
- Torque .

Improper tooth preparation

- Over reduction .
- Over convergency .
- Short preparation .
- Insufficient retentive grooves or pins in partial coverage restoration .

Improper bridge design

- Selection of partial coverage when complete coverage is indicated .
- Insufficient number of abutment in relation to span length .

Improper construction

- Ill fitting casting .
- Poorly adapted margins .
- Improper alloy selection .

Improper cementation

- Improper isolation or dryness .
- Improper manipulation .
- Unsteady positioning and loading during setting .

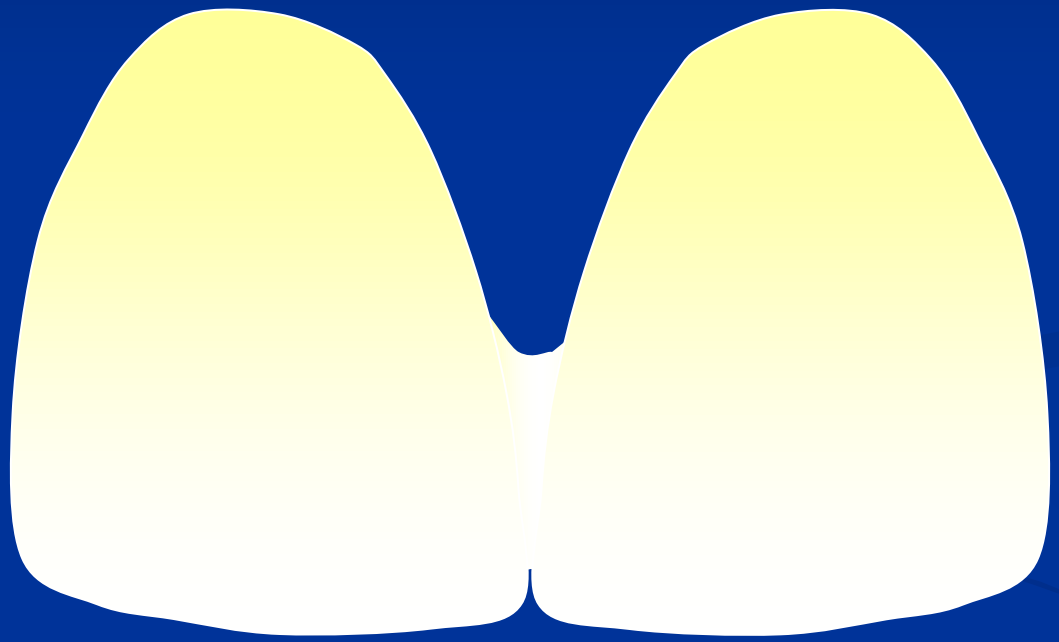
- A study showed that using a chamfer finish line produced significantly smaller marginal gap than shoulder finish line .
- Another study , found smaller marginal gap with shoulder finish line .

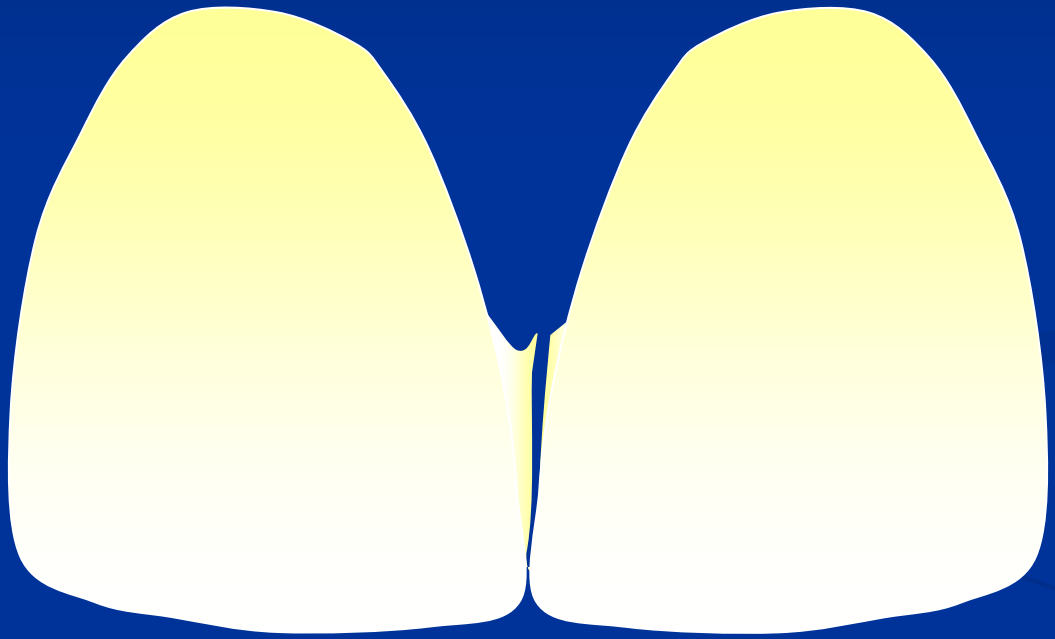
- A study found that, there is **no** difference in marginal discrepancy between all ceramic crowns and porcelain fused to metal crowns.

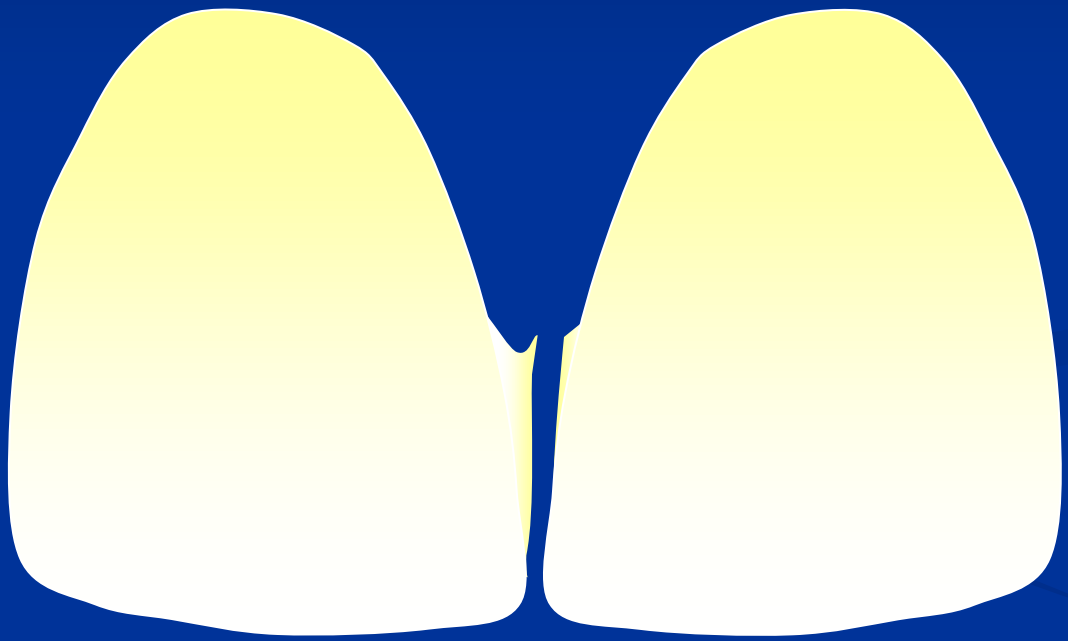
- A study showed that marginal discrepancy increased after cementation .
- The crowns luted with resin cements were found to have **2-5** times smaller marginal discrepancy than crowns which luted with zinc phosphate cement .

Prosthetic fracture

Joint fracture



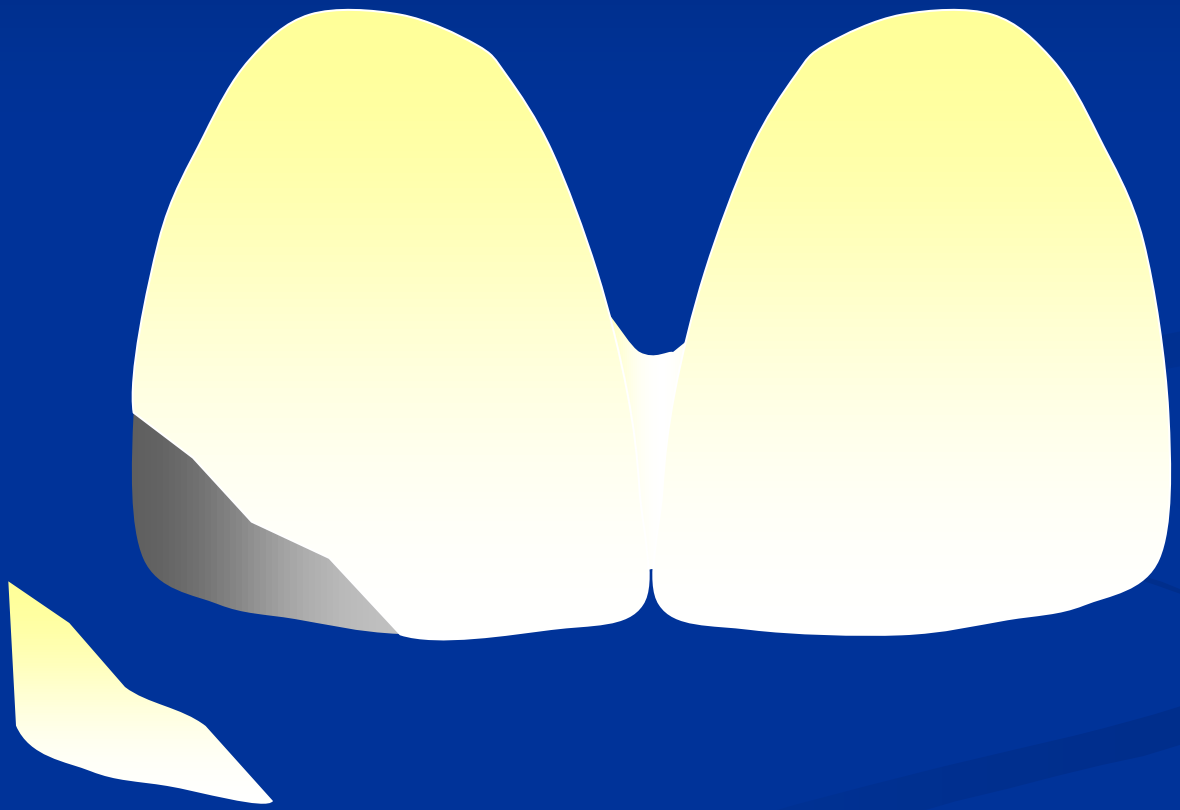


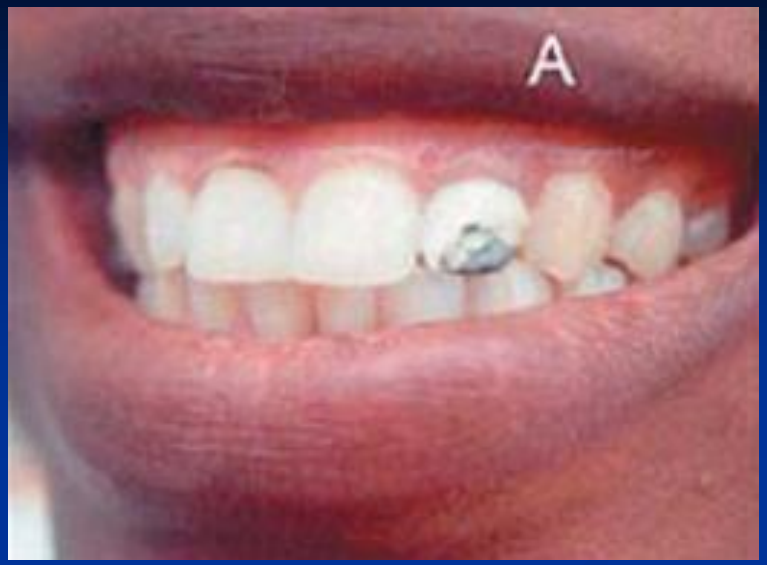


Due to;

- Internal porosity.
- Improper solder alloy.
- Improper soldering technique.
- Strain hardening.

Veneering fracture



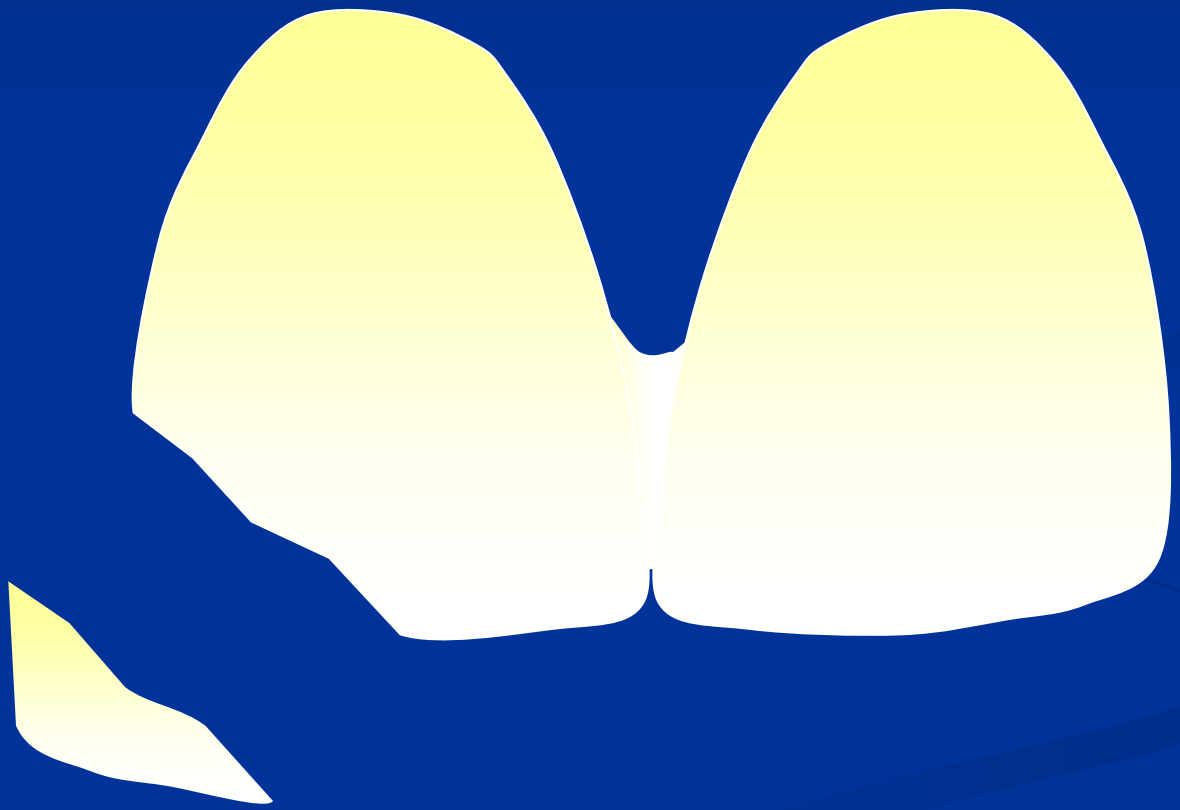

A


B

Due to;

- Inadequate **bond** between **facing** and **metal**.
- Metal and porcelain **incompatibility**.
- **Excessive** occlusal function..
- Improper **laboratory** procedures.

All ceramic crown fracture



Due to;

- Improper **case selection**.
- Improper **preparation**.
- Improper **construction**.
- Improper **cementation**.

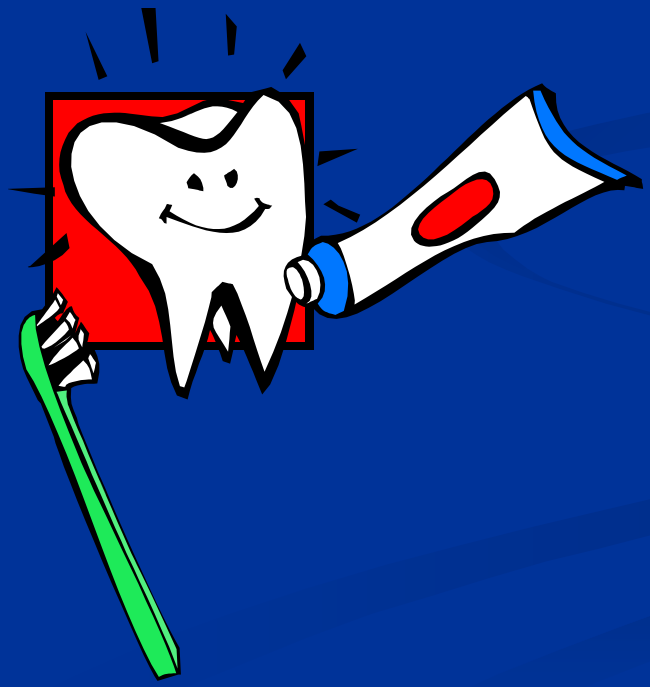
3

Esthetic failure


2M

4

Maintenance failure



Does failed prosthetic appliance may cause psychological disturbance ?


THANK YOU